

ConditionMonitoring Package CMP

Description

The ConditionMonitoring Package CMP is an online measuring system which is used for determine particle contamination, water saturation and the fluid condition in hydraulic and lubricating fluids depending on the sensor equipment.

Depending on the version, the ConditionMonitoring Package CMP is comprised of motor, pump and sensor connection block and can thereby be integrated hydraulically without difficulty in fluid circulation systems of existing machines. In addition, optional data storage and network communication modules as well as terminal boxes for electrical installation enable optimum transfer of the measured values to data entry and evaluation systems.

The CMP thus presents itself as a compact and easy-to-retrofit condition monitoring solution for fluids.

Fields of application

- Monitoring of hydraulic and lubrication systems in the marine, paper, steel, cement and energy industries
- Component cleanliness monitoring in test benches
- Monitoring of oil cleanliness in tanks (depressurized) and pressure lines

Your benefits

- System for flexible combination with different fluid sensors
 - ContaminationSensor CS1000 for measuring solid particle contamination
 - AquaSensor AS1000 or AS3000 for measuring the water saturation
 - MetallicContamination Sensor MCS1000 for determination of the metallic wear
 - HYDACLab HLB1400 for determination of the fluid condition
- Approved solution for measurement tasks with low system pressure
- Also available for pumps with high inlet pressures
- Perfect tool for implementing modern maintenance strategies

Technical Data

Hydraulic data				
	CMPxxx-1	CMPxxx-2	CMPxxx-4	CMPxxx-5
Maximum operating pressure P _{IN} (IN)	-0.4 ... 0.5 bar	-0.4 ... 120 bar	-0.4 ... 80 bar	-0.4 ... 4 bar
P _{OUT} (OUT)	5 bar	5 bar	5 bar	0.5 bar
Leak oil (LEAKAGE)	-	0.5 bar	-	-
Hydraulic connections P _{IN} (IN) acc. to ISO 228-1	G ¼	G ¼	G ¼	G ¾
P _{OUT} (OUT) acc. to ISO 228-1	G ¼	G ¼	G ¼	G ½
Drain/leakage oil (LEAKAGE) acc. to ISO 228-1	-	G ¼	-	-
Permissible viscosity range for operation	10 ... 3000 mm ² /s	10 ... 3000 mm ² /s	2 ... 1000 mm ² /s	12 ... 20,000 mm ² /s
Permissible viscosity range for the measurement operation	10 ... 1000 mm ² /s	10 ... 1000 mm ² /s	2 ... 800 mm ² /s	12 ... 20,000 mm ² /s
Flow rate	≈ 130 ml/min @50 Hz ≈ 160 ml/min @60 Hz	≈ 180 ml/min @50 Hz ≈ 215 ml/min @60 Hz	≈ 280 ml/min @50 Hz ≈ 340 ml/min @60 Hz	≈ 6 l/min @50 Hz ≈ 7 l/min @60 Hz
Permissible fluids	Hydraulic and lubrication fluids based on mineral oil			
	-	-	Diesel fuels	-
Pump type	Gear pump			
Permitted fluid temperature range	0 ... 70°C			0 ... 85°C
Electrical data				
Power consumption (depending on motor type and operating conditions)	≤ 180 W @ 50 Hz / ≤ 210 W @ 60 Hz			≤ 370 W @ 50 Hz / ≤ 440 W @ 60 Hz
Protection class	IP55			
General data				
Dimensions	See corresponding version/drawing			
Empty weight	See corresponding version			
Permissible ambient temperature range	0 ... 40°C			
Permitted storage temperature range	-40 ... 80°C			
Relative humidity	maximum 90%, non-condensing			
Environmental conditions				
Emission sound pressure level LPA	< 70 dB(A)			

Model code

CMP 100 0 - 4 - X - W/N/X60/O60 - AS1C /-000

Type

CMP = ConditionMonitoring
Package

ContaminationSensor

121 = CS1000 -> ISO / SAE without display, 4-20 mA
 122 = CS1000 -> ISO / SAE with display, 4-20 mA
 131 = CS1000 -> ISO / SAE / NAS without display, 4-20 mA
 132 = CS1000 -> ISO / SAE / NAS with display, 4-20 mA
 431 = MCS1000 -> 70µm / ¼", RS485
 432 = MCS1000 -> 70µm / ¼", RS485 (Modbus RTU)
 437 = MCS1000 -> 70µm / ¼", RS485, Ethernet (Modbus TCP)
 441 = MCS1000 -> 100µm / ½", RS485
 442 = MCS1000 -> 100µm / ½", RS485 (Modbus RTU)
 447 = MCS1000 -> 100µm / ½", RS485, Ethernet (Modbus TCP)
 451 = MCS1000 -> 200µm / 1", RS485
 452 = MCS1000 -> 200µm / 1", RS485 (Modbus RTU)
 457 = MCS1000 -> 200µm / 1", RS485, Ethernet (Modbus TCP)

Fluid

0 = mineral oil
 1 = phosphate ester (CS and AS only)

Pump type

Z = without pump (MCS only)
 1 = gear pump, standard (CS only)
 2 = gear pump,
 inlet pressure-stability with drain line (CS only)
 4 = gear pump, magnetically coupled,
 inlet pressure-stability without drain line (CS only)
 5 = gear pump, P(IN) = max. 4 bar,
 Q = 6 l/min (only MCS1000 -> 70µm)

Electrical interface

Z = defined via standard interface(s) of the
 installed sensors (male connector, pin assignment)
 X = on request (customized)
 C11 = ddata logger and network interface CSI-C-11

Pump supply voltage

W/N/X60/O60 = 230V, 50 Hz, 3 Ph. / 265V, 60 Hz, 3 Ph.
 400V, 50 Hz, 3 Ph. / 460V, 60 Hz, 3 Ph.
 (other supply voltage types
 on request)
 M = 230V, 50 Hz, 1 Ph.
 U = 24 V DC
 Z = without pump

Additional sensor

AS1C = AquaSensor AS1000 with 2x analogue output 4 ... 20 mA
 AS12 = AquaSensor AS1000 with 2x switching output (configurable)
 AS35 = AquaSensor AS3000 with 2x switching output (configurable)
 and 1x analogue output (configurable);
 no digital interface
 HLB10 = HydacLab HLB1400 with 2x output (switching output /
 analogue output - freely selectable / configurable)
 HLB11 = HydacLab HLB1400 with RS485 (2 wire)
 HLB12 = HydacLab HLB1400 with 2x output (switching output /
 analogue output - freely selectable / configurable) and
 RS485 (2 wire)
 HLB 13 = HydacLab HLB1400 with CANopen interface
 Z(AS) = without additional sensor, prepared for AS
 Z(HL) = without additional sensor, prepared for HLB

Modification number

000 = standard

Scope of delivery

- CMP, ready for connection
- Installation and Maintenance Instructions

Notes:

- Reg. CMP4xxx-Z-x-x/-xxx:
 Please note that for the CMP4xxx
 with inductive metal particle counter
 MCS 1000 and without integrated pump,
 the volume flow conditioning is carried
 out using orifices. These are not part of
 the scope of delivery and must be
 designed according to the predominant
 operating conditions in the respective
 application.
- Reg. CMP1xxx-Z-x-x/-xxx:
 This product configuration is not
 applicable as CMP. We refer to the use
 of the product series
 HYDAC FluidMonitoring Module FMM

Accessories

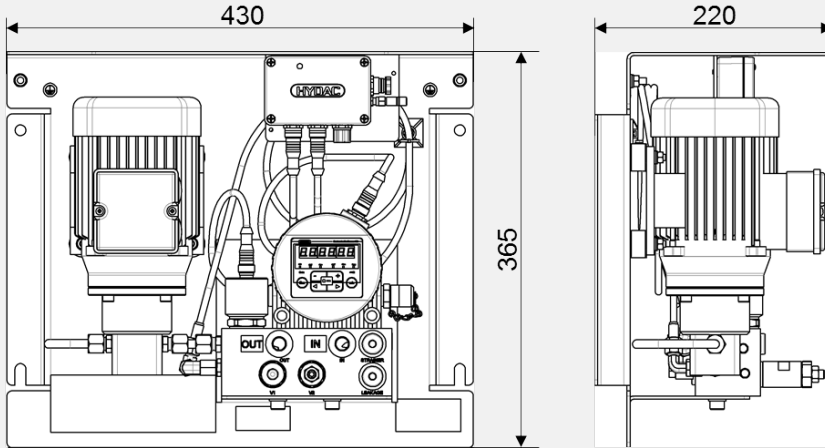
Designation	Part no.
Supply voltage (for sensors and data logger)	
PS5 power supply 100 – 240V AC, 50-60 Hz, 1.1 A, IP40; female connector M12, 5-pin, power supply recommended for data logger CSI-C-11	3399939
ZBE47S-05 connection cable, socket plug 5 pin with cable, open cable end, length= 5m	3527626
ZBE42S-05 connection cable, socket plug 8 pin with cable, open cable end, length= 5m	3281239
Connection cable, sensors	
ZBE43-05 connection cable, coupling / plug 8 pin, length = 5m	3281240
ZBE30-05 connection cable, coupling / plug 5 pin, length = 5m	6040852
Network cable (LAN)	
ZBE 45-05 network cable (patch), socket plug 4 pin, d-coded / male connector RJ45, length = 5m	3346100
ZBE 45-10 network cable (patch), socket plug 4 pin, d-coded / male connector RJ45, length = 10m	3346101

Dimensions (preferred models that are selected)

CMP with magnetically coupled gear pump (inlet pressure-stability), fluid sensors CS1000 and HLB1400 and data logger/ network interface CSI-C-11

Model code: CMP1220-4-C11-W/N/X60/O60-HLB10/-000

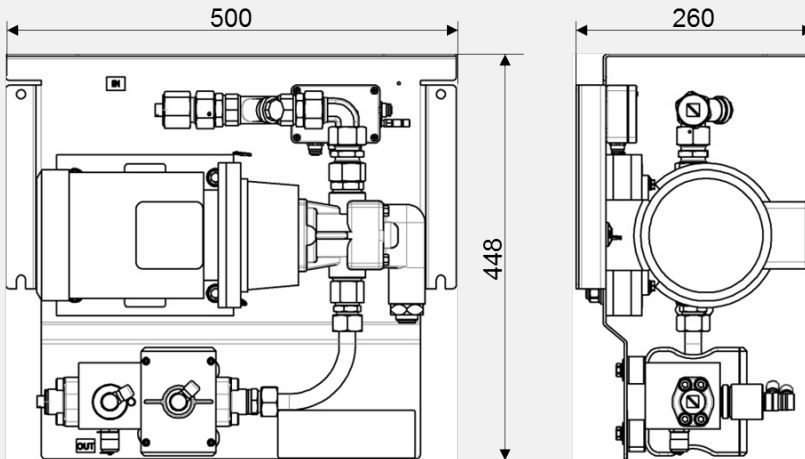
Weight: ~22 kg



CMP with gear pump, fluid sensors MCS1310 and HLB1400 and data logger/ network interface CSI-C-11

Model code: CMP4310-5-C11-W/N/X60/O60-HLB10/-000

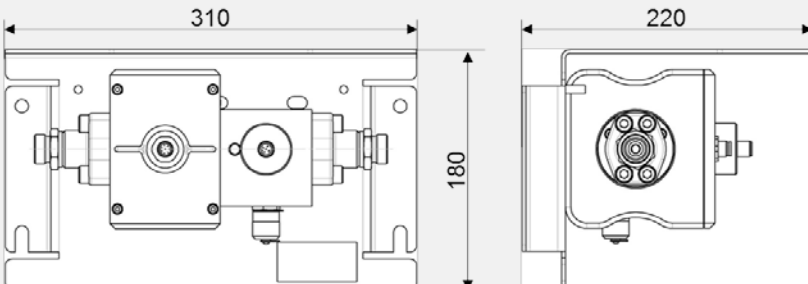
Weight: ~27 kg



CMP without motor pump assembly, fluid sensors MCS1310 and HLB1400 and data logger/ network interface CSI-C-11

Model code: CMP4310-Z-Z-Z-HLB12/-000

Weight: ~10 kg



All dimensions in mm

Preferred models

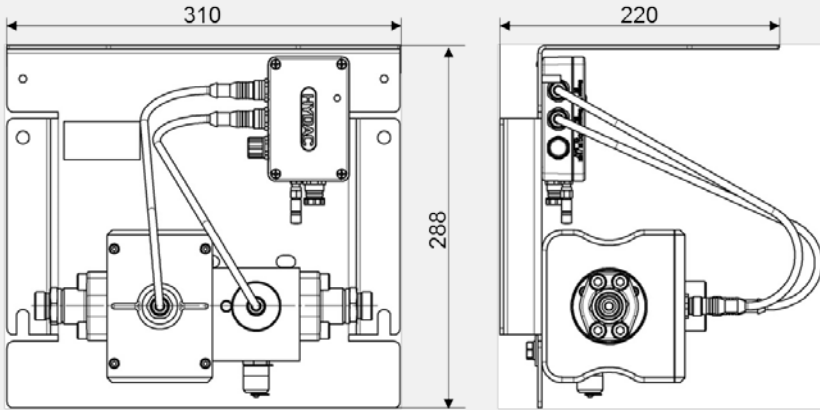
Designation	Part no.
CMP1220-4-C11-W/N/X60/O60-HLB10/-000 with sensors CS 1220 (display), and HLB 1400, pump with inlet pressure stability, 3-phase motor, data logger CSI-C-11	4512707
CMP1220-4-C11-M-HLB10/-000 with sensors CS 1220 (display), and HLB 1400, pump with inlet pressure stability, 1-phase motor, data logger CSI-C-11	4512706
CMP1220-4-Z-W/N/X60/O60-HLB12/-000 with sensors CS 1220 (display), and HLB 1400, pump with inlet pressure stability, 3-phase motor	4512711
CMP1220-4-Z-M-HLB12/-000 with sensors CS 1220 (display), and HLB 1400, pump with inlet pressure stability, 1-phase motor	4512709
CMP4310-5-C11-W/N/X60/O60-HLB10/-000 with sensors MCS 1310, and HLB 1400, pump, 3-phase motor, data logger CSI-C-11	4512713
CMP4310-5-C11-M-HLB10/-000 with sensors MCS 1310, and HLB 1400, pump, 1-phase motor, data logger CSI-C-11	4512712
CMP4310-5-Z-W/N/X60/O60-HLB12/-000 with sensors MCS 1310, and HLB 1400, pump, 3-phase motor	4512795
CMP4310-5-Z-M-HLB12/-000 with sensors MCS 1310, and HLB 1400, pump, 1-phase motor	4512714
CMP4310-Z-C11-Z-HLB10/-000 with sensors MCS 1310, and HLB 1400, without pump, data logger CSI-C-11	4512796
CMP4310-Z-Z-Z-HLB12/-000 with sensors MCS 1310, and HLB 1400, without pump	4512797

Dimensions (preferred models that are selected)

CMP without motor pump assembly, fluid sensors MCS1310 and HLB1400 and data logger/ network interface CSI-C-11

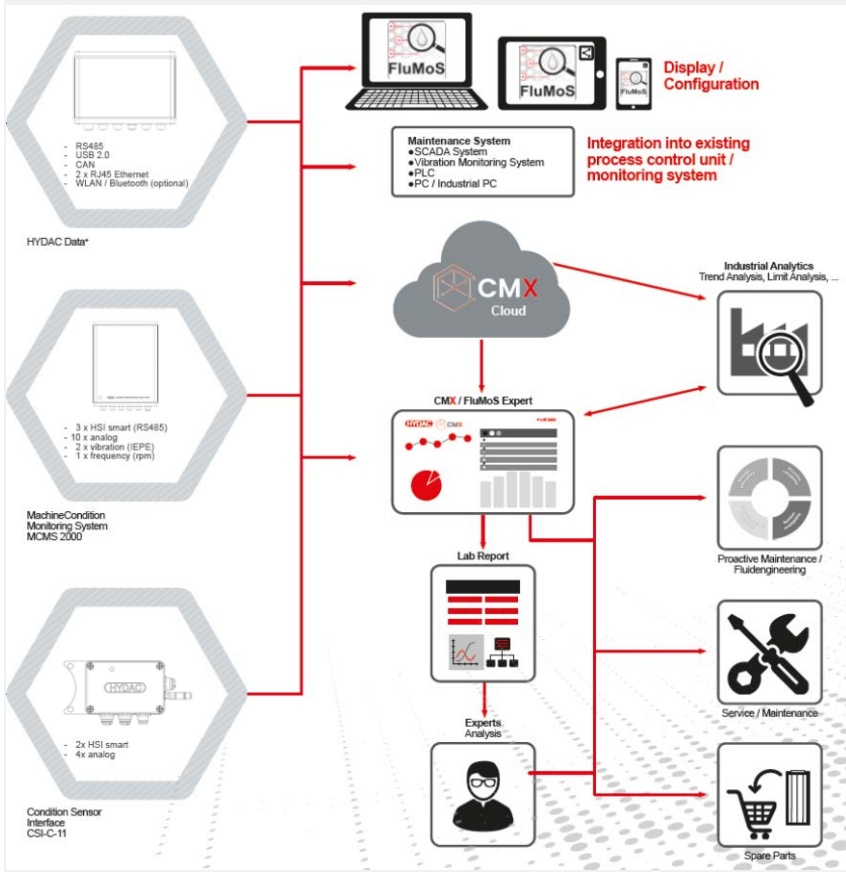
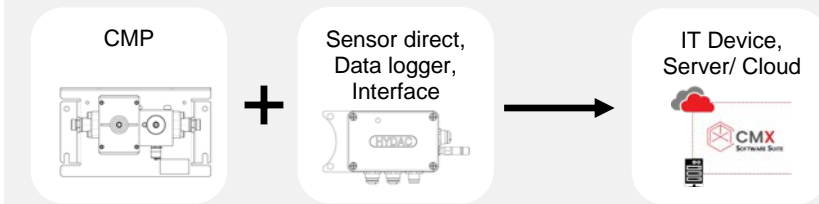
Model code: CMP4310-Z-C11-Z-HLB10/-000

Weight: ~12 kg



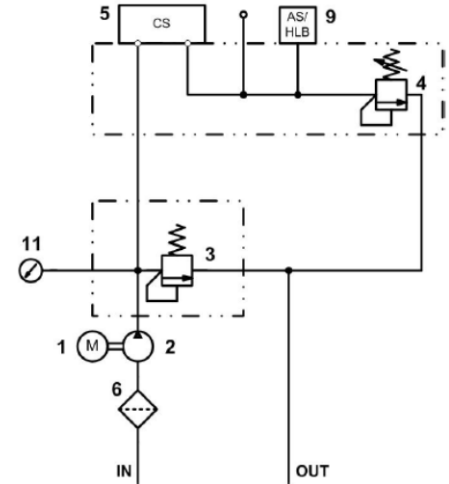
All dimensions in mm

IT System Connection (Connectivity)



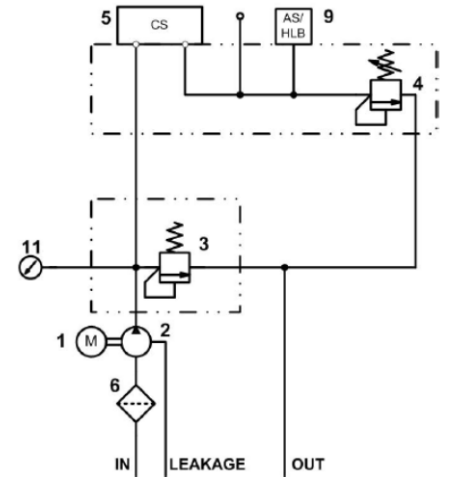
Hydraulic circuit (Examples)

CMP1xxx-1-Z-W/N/X60/O60-x/-000 and
CMP1xxx-4-Z-W/N/X60/O60-x/-000



Item	Designation
IN	Inlet
OUT	Outlet
1	Electric motor
2	Gear pump
3	Pressure relief valve
4	Counter balance valve
5	Sensor 1 (ContaminationSensor)
6	Strainer
9	Sensor 2 (AquaSensor or HYDACLab)
11	Pressure gauge

CMP1xxx-2-Z-W/N/X60/O60-x/-000

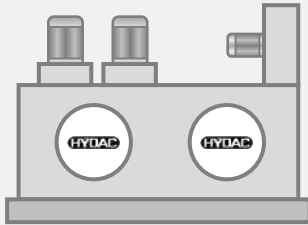


Item	Designation
IN	Inlet
OUT	Outlet
LEAK	Outlet (drain line)
1	Electric motor
2	Gear pump
3	Pressure relief valve
4	Counter balance valve
5	Sensor 1 (ContaminationSensor)
6	Strainer
9	Sensor 2 (AquaSensor or HYDACLab)
11	Pressure gauge

Condition Monitoring packages (application examples)

The following application examples show typical sensor configurations based on the HYDAC ConditionMonitoring Package CMP for a fluid-based machine condition monitoring solution. However, it should be noted that the sensor selection must always be adapted to the particular application or condition monitoring task and may differ from the examples listed below

Hydraulic power & Lubrication Units



Industrial Gearboxes (Lubrication)



Economy

CMP1220-4-C11-W/N/X60/O60-HLB10/-000 (4512707)

Fluid conditioning unit with pump (pre-pressure stable) as well as optical particle counter CS 1220, fluid condition sensor HLB 1400 and data logger CSI-C-11

CMP4310-5-C11-W/N/X60/O60-HLB10/-000 (4512713)

Fluid conditioning unit with pump and inductive particle counter MCS 1310, fluid condition sensor HLB 1400 and data logger CSI-C-11

Standard

CMP1220-4-Z-W/N/X60/O60-HLB12/-000 (4512711)

Fluid conditioning unit with pump (pre-pressure stable) as well as optical particle counter CS 1220 and fluid condition sensor HLB 1400

CMP4310-5-Z-W/N/X60/O60-HLB12/-000 (4512795)

Fluid conditioning unit with pump and inductive particle counter MCS 1310, fluid condition sensor HLB 1400 and data logger CSI-C-11

CSI-C-11-0-0-1/-000 (4247534)

Data logger CSI-C-11 with analogue interface for connection of max. 4 additional analogue sensors

CSI-C-11-0-0-1/-000 (4247534)

Data logger CSI-C-11 with analogue interface for connection of max. 4 additional analogue sensors

ZBE CSI 60 (4420372)

Sensor connection adapter for connecting max. 4 analog sensors to CSI-C-11-0-0-1/-000

ZBE CSI 60 (4420372)

Sensor connection adapter for connecting max. 4 analog sensors to CSI-C-11-0-0-1/-000

HPT 506-C-05.0-A-000 (925317)

Filter differential pressure measurement

HPT 506-C-05.0-A-000 (925317)

Filter differential pressure measurement

EVS 3106-A-0300-000 (909812)

Measurement of the volume flow (pump)

Current consumption/power of coupled drive ⇒ no sensor

(Measured variable processed as 4-20 mA signal)

HDA 4846-A-400-000 (922154)

System pressure measurement

ENS 3216-3-0520-000-P (908671)

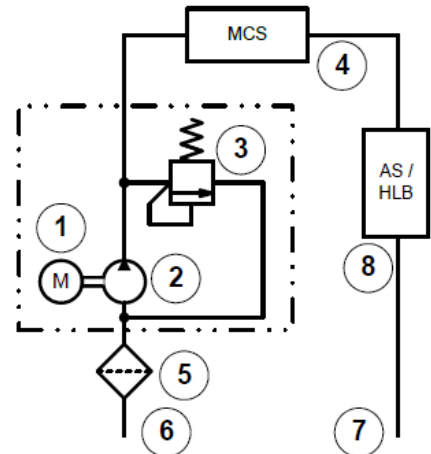
Level measurement

Measurement data storage and analysis:

In the above examples, measurement data can be stored locally on the HYDAC CSI-C-11 data logger, in higher-level data acquisition systems or in a cloud - for example HYDAC CMX. Using the optionally available HYDAC CMX, measurement data can not only be stored and visualised, but also analysed, processed and made available to different user groups in an action-oriented manner.

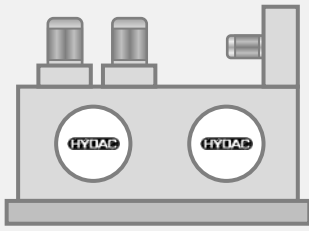
Hydraulic circuit (Example)

CMP4xxx-5-Z-W/N/X60/O60-x/-000



Item	Designation
1	Electric motor
2	Gear pump
3	Pressure relief valve
4	Sensor 1 (Metallic Contamination Sensor)
5	Strainer
6	Suction port (IN)
7	Return-line connector (OUT)
8	Sensor 2 (AquaSensor or HYDACLab)

Hydraulic power & Lubrication Units



Industrial Gearboxes (Lubrication)



Premium

CMP1220-4-Z-W/N/X60/O60-HLB11/-000 (4512900) Fluid conditioning unit with pump (pre-pressure stable) as well as optical particle counter CS 1220 and fluid condition sensor HLB 1400	CMP4310-5-Z-W/N/X60/O60-HLB11/-000 (4449963) Fluid conditioning unit with pump as well as inductive particle counter MCS 1310 and fluid condition sensor HLB 1400
MCMS2233-2-0-0/-000 (4444482) Data logger	MCMS2233-2-0-0/-000 (4444482) Data logger
VS3110-1-0-0/-000 (4350671) Vibration measurement on high pressure pump	VS3110-1-0-0/-000 (4350671) Vibration measurement at the bearing of the transmission drive input shaft
VS3110-1-0-0/-000 (4350671) Vibration measurement on high lubrication pump	VS3110-1-0-0/-000 (4350671) Vibration measurement at the bearing of the transmission output shaft
HPT 506-C-05.0-A-000 (925317) Filter differential pressure measurement	VL 2 GW.0 /-V-113 (1285170) Filter differential pressure and system pressure measurement
HFT 2136-C-0035-0110-7-S-0-000 (909405) Measurement of the volume flow (high pressure pump)	HSS210-3-050/-000 (923193) Speed measurement at gearbox input shaft
HFT 2136-C-0035-0110-7-S-0-000 (909405) Measurement of the volume flow (lubrication pump)	HNT 1226-C-0520-000 (923717) Level measurement
HDA 4846-B-400-000 (922203) Measuring the pre-charge pressure at the hydraulic accumulator	Current consumption/power of coupled drive ⇒ no sensor (Measured variable processed as 4-20 mA signal)
HDA 4846-B-400-000 (922203) System pressure measurement 1	
HDA 4846-B-400-000 (922203) System pressure measurement 2	
HNT 1226-C-0520-000 (923717) Level measurement	

Measurement data storage and analysis:

In the above examples, measurement data can be stored temporarily on the HYDAC MCMS 2000 data logger or on the HYDAC FluMoS expert Server (SQL database) included in the scope of delivery, as well as in higher-level data acquisition systems or in a cloud - for example HYDAC CMX. The measurement data can be stored, analysed, visualised and being provided to different user groups in an action-oriented manner using the optionally available HYDAC CMX or the HYDAC FluMoS expert PC software suite included in the scope of delivery.

Note:

The information in this brochure relates to the operating conditions and applications described.

In the event of deviating applications and/or operating conditions, please contact the respective department concerned. Subject to technical modifications.

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